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NEW FRESH-WATER GASTROPOD MOLLUSKS OF THE GENUS CHILINA OF SOUTH AMERICA

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The five new species herein described have recently been added to the collection of the United States National Museum, or have been in the collection unnamed or wrongly identified.

Genus CHILINA Gray

CHILINA BULLOCKI, new species

Plate 1, Figures 4, 6

Shell rather thin, ovate. Whorls moderately rounded, but much longer than wide. Axial sculpture of very obscure incremental striae, slightly crenulating the suture. Spiral sculpture of faint indications of revolving striae. Color of type dark olive-green with a band of interrupted reddish spots a short distance below the suture and three nearly continuous bands of the same color lower down on the whorl. Externally these bands are faint, but in the aperture they show plainly although thinly coated with the white and pinkish of the interior. Aperture about two-thirds the length of the shell, outer lip simple, columellar lip white, its lower part nearly straight, broad, reflected over a false umbilicus on the left margin, and with an oblique strong, entering fold at its upper end. Parietal wall with a thin white callus and a revolving plait on its lower portion. Interior whitish, flushed with pink, the reddish bands of the exterior showing plainly.

Type.—The type (U.S.N.M. No. 414163) measures: Length, 27 mm; diameter, 15 mm; length of aperture, 19 mm; axial length of body whorl, 23 mm. It and 24 paratypes (U.S.N.M. Nos. 414164, 414165) were collected and presented by D. S. Bullock, of the Escuela Agricola de "El Vergel," at Angol, Chile, and came from the "mill canal that comes from Rio Malleco, El Vergel, Angol, Chile, November, 1928." Four other paratypes were returned to Mr. Bullock.

Remarks.—As shown by the figures, this species is related to *C. iheringi* Marshall, but is much smaller, and more ovate. Like others from this general region, this species shows a tendency to have the whorls shouldered, the body whorl inflated, and the length of the shell in proportion to diameter to become less. It is related also to *C. bulloides* Orbigny.

Plate 1, Figure 6, shows the color marking revealed by removal of the periostracum of a paratype (U.S.N.M. No. 414164).

CHILINA IHERINGI, new species

PLATE 1, FIGURE 8

Shell large, inflated, ovoid. Spire short, apex lost. Body whorl very large, about seven-tenths of the length of the shell, subcylindrical, its outer wall nearly vertical, slightly shouldered. Axial sculpture consisting of fine incremental threads, the longer rest periods emphasized by greater strength and deeper color. Spiral sculpture of irregularly spaced impressed lines and crude riblets, which become more prominent on the basal area. Surface slightly malleated. Suture crenulated. Color light olive-yellowish with four revolving bands of reddish, the upper one well marked, the others hardly visible except when viewed through the shell by transmitted light. Aperture very long, its outer wall slightly compressed, outer lip thin. Interior whitish, the external bands showing through, especially if held up to the light. Columella straight, stout, broad, white, with a strong entering fold at its upper part. A false umbilicus formed by the reflecting of the left margin of the columella. Parietal wall with a thin callus.

Type.—The type (U.S.N.M. No. 414166) measures: Length, 45 mm; diameter, 27 mm; length of aperture, 30 mm. It and two paratypes (U.S.N.M. No. 363765) come from Lake Todas Santos, Province of Llanquihue, Chile, received from Dr. H. von Ihering. This lake is on the Pacific side of the Andes and drains into the Gulf of Corcovado. A fourth specimen (U.S.N.M. No. 362988) was received from Dr. F. Felippone, with the general locality, Chile. It is almost an exact counterpart of one of the paratypes and probably came from the same locality.

Remarks.—Until lately the author regarded this as an optimum condition of the inflated form of *C. oldroydae* Marshall. The great size of *C. iheringi* and the different locality indicate that they belong to two species or to two subspecies of the same original stock.

CHILINA LLANQUIHUENSIS, new species

PLATE 1, FIGURE 1

Shell globose-ovoid, polished. Whorls well rounded; sutures not deep, but margined by a stout revolving thread. Axial sculpture weak, consisting of faint threads of growth, the rest periods more marked in strength and darker color. Spiral sculpture lacking. Color dark olive-green marked with five bands of spots of chestnut, scarcely visible outside, but very prominent within. Body whorl slightly inflated, outer lip thin. Columella slightly broadened, erect, its upper extremity with a sharp oblique entering fold. Parietal wall rather thickly coated with callus and bearing a small spiral fold at its middle portion, its upper portion stained with bright chestnut. Interior white, the color bands very prominent.

Type.—The type (U.S.N.M. No. 414167) measures: Length, 16 mm; diameter, 13 mm. It and a paratype (U.S.N.M. No. 363766) were presented by Dr. H. von Ihering and came from Lake Llanquihue, Chile. This lake drains directly into the Pacific Ocean, and has also a connection by canal with the Gulf of Chaco, the northern end of the Gulf of Corcovado.

Remarks.—This species shows no very close relationship to any other. It may be distantly related to its geographically nearest neighbor, *C. bulloides* Orbigny, of the island of Chiloe, Chile. A highly polished periostracum such as possessed by this species, while not unknown in other species, is of rare occurrence.

CHILINA SIMPLEX, new species

PLATE 1, FIGURES 2, 9

Shell rather thin, slender, elongate-ovoid. Spire very short, about 1 mm in length; the body whorl very long, about 13 mm; suture well marked, but not shouldered. Axial sculpture consisting of many fine threadlike striae, invisible to the unaided eye but revealed by a lens. Rest periods easily seen, partly because stouter than the growth striae, but more because they are emphasized by darker color. No indication of spiral striae. Color almost uniform light olive-green, with two scarcely visible bands of pale reddish arrowhead spots, which are more easily seen within the aperture or by transmitted light. One of these bands is a short distance below the suture, the other two-thirds down the whorl. There are also a few faint spots of the same color, indicating the possibility of more bands possible to the species. Aperture long, rather narrow. Outer lip simple, columellar lip white, rather broad and

nearly flat and reflected to form a slight appearance of an umbilicus. The fold on the columella, characteristic of the genus, is very small, situated rather high up and within, so that it does not show in a front view. Parietal wall with a thin, transparent callus.

Type.—The type (U.S.N.M. No. 414169) measures: Length, 14.5 mm; diameter, 7.5 mm; length of aperture, 10 mm. It and a younger specimen (U.S.N.M. No. 363022) were presented by Mrs. T. S. Oldroyd and were collected by J. W. Pemberton, December 26, 1914, in the Santa Cruz River at the outlet of Lake Argentino, Province of Santa Cruz, Argentina. The latitude and longitude quoted on the label are 50° 15′ S. and 71° 48′ W., respectively.

Remarks.—This interesting species makes a near approach to being unicolored and upon cursory examination it would be said to be uniform light olive-green, but closer scrutiny shows it to possess the reddish spots and tinges characteristic of the genus. What spots show are arranged in bands and have a marked tendency to assume an arrowhead pattern. The sculpture, though nearly microscopic, is essentially the same as that of *C. limnaeformis* Dall, type of Dall's subgenus *Pseudochilina* (U.S.N.M. No. 56423), and were that subgenus valid the species might be placed with it. In the weak, nearly lacking columellar fold it would fall into the subgenus *Acyrogonia* Mabille, in which the columellar plait is said to be lacking, but that subgenus is founded upon a character which shows every degree of variation in strength as we turn from species to species. I have never seen a specimen of *Chilina* in which the columellar fold was entirely lacking. It may be very weak and nearly hidden by being set high up on the columella and nearly on its inner edge, but careful examination always has shown that it is present and fulfills in all particulars the definition of typical *Chilina*. The new species here described is a case exactly to the point. *C. simplex* is related to a number of other species, perhaps the nearest being *C. fulgurata oligoptyx* Pilsbry. Both are probably descended from the same or nearly related ancestors. It is related also to *C. parchappi minor* Marshall of Mar del Plata, Argentina. So far as known to the author, all the species of *Chilina* which have a very weak fold belong in the Atlantic drainage. The one described by Mabille (*C. fusca*) and the one by Mabille and Rochebrune (*C. nervosa*) came from Punta Arenas, Argentina, which is near the halfway point of Magellan Strait and hence can be said to be in neither the Atlantic nor the Pacific drainage, but in both.

CHILINA NEUQUENENSIS, new species

PLATE 1, FIGURE 5

Shell rather thin, slender, very elongate, turreted. Spire one-half the length of the whole shell, sharply acuminate. Whorls about 6.5 (nuclear whorl lost). Early portion of shell normal but a marked ridge begins to develop upon the upper portion of the whorl, which on the later whorls becomes almost a carina, forming a sloping shoulder. Suture well marked, slightly crenulate. Axial sculpture consisting of numerous, irregular growth riblets, with longer rest periods more strongly marked. Spiral sculpture of two impressed lines near the suture, several revolving riblets on the lower part and faint indications of spiral striae. The crossings of the spiral riblets by the axial sculpture give a malleated appearance to the lower portion of the body whorl. Ground color olive-yellowish with zigzag flashings of reddish on the upper whorls, two bands of arrowhead markings of the same color, and three like-colored plain bands on the body whorl. Aperture very long and narrow, its outer wall perpendicular, outer lip broken off but evidently simple. Columella arcuate, rather broad, white, with a prominent entering oblique fold near its middle portion. Parietal wall with a thin, white callus. Color of interior pinkish overlaid with a thin deposit of white, the exterior banding and arrow markings showing through.

Type.—The type (U.S.N.M. No. 414168) measures: Length, 37 mm; diameter, 18 mm; length of aperture, about 18 mm. It was collected in December, 1926, in "Las Lagunas," Province of Neuquen, Argentina, by Senor Mendez, of Santiago, Chile, and was presented by D. S. Bullock, of Angol, Chile. As the Province of Neuquen is on the east side of the Andes, this would be in the Atlantic drainage.

When received, the specimen was completely encrusted, except the aperture, with a thick deposit of iron, through which no hint of the colors could be seen and which to a large degree concealed the form of the shell. Oxalic acid quickly removed the iron, revealing a good specimen except for the lost nucleus and broken outer lip.

Remarks.—The nearest relative is *Chilina oldroydae* Marshall, which occurs in Lake Fetalafquen, Province of Chubut, not very far south of Neuquen. *C. oldroydae* is a much larger, more inflated shell than *C. neuquenensis.* The former, as shown in figures with the original description, varies from bulimoid form to a turreted form on one side and to a nearly globose form on the other side. The two species may have had a common ancestry, or *C. neuquenensis* may be a subspecies of *C. oldroydae* or an extreme development of the turreted form of the latter. In slenderness, *C. neuquenensis* vies with *C. fuegiensis* E. A. Smith for first place, but in other respects the two species are not closely related.

CHILINA LIMNAEFORMIS Dall

PLATE 1, FIGURES 3, 7

1870. *Chilina* (*Pseudochilina*) *limnaeformis* DALL, Ann. Lyc. Nat. Hist. (New York), vol. 9, p. 357.

1881. *Chilina* (*Pseudochilina*) *limnaeformis* E. A. SMITH, Proc. Zool. Soc. London, p. 846.

1911. *Chilina limnaeformis* DALL, *in* Pilsbry, Non-marine Mollusca of Patagonia, Reports of Princeton University Expedition to Patagonia, 1896–1899, vol. 3, p. 531.

This species is the type of the subgenus *Pseudochilina* Dall, described at the same time. The subgenus was defined thus: "shell thin, covered with a rough fibrous epidermis; spire elevated, acute." Under the description of the species, he says: "The curious epidermis and broad plicate columella alone distinguished this singular shell from a *Limnaea*." As this type (U.S.N.M. No. 56423) has never been figured, a view of it is given in this paper.

By "fibrous epidermis" Dall probably meant that the axial sculpture consists of numerous threadlike incremental lines. In discussing this type specimen Pilsbry said: "The irregular or fibrous surface which served to characterize the subgenus, seems to me to be wholly due to erosion, the cuticle or periostracum being lost from the unique type in the National Museum. In other characters the shell is a typical *Chilina*."

The shell was more or less covered with a deposit of lime and dirt as often occurs with shells, especially those from lacustrine habitats. When this deposit is removed, the periostracum is revealed as present on all but a portion of the front aspect and is normal. The "fibrous" appearance is due to the axial incremental threads underlying the periostracum. Pilsbry is right in thinking the species is not subgenerically different from the genus. The locality quoted, Chile, is indefinite. The shell probably classifies with others having a rather thin shell, and a broad columella with a prominent, nearly horizontal, fold such as *C. oldroydae* Marshall, and *C. iheringi* Marshall of the present paper. It may eventually prove to be a young specimen of some already described species.

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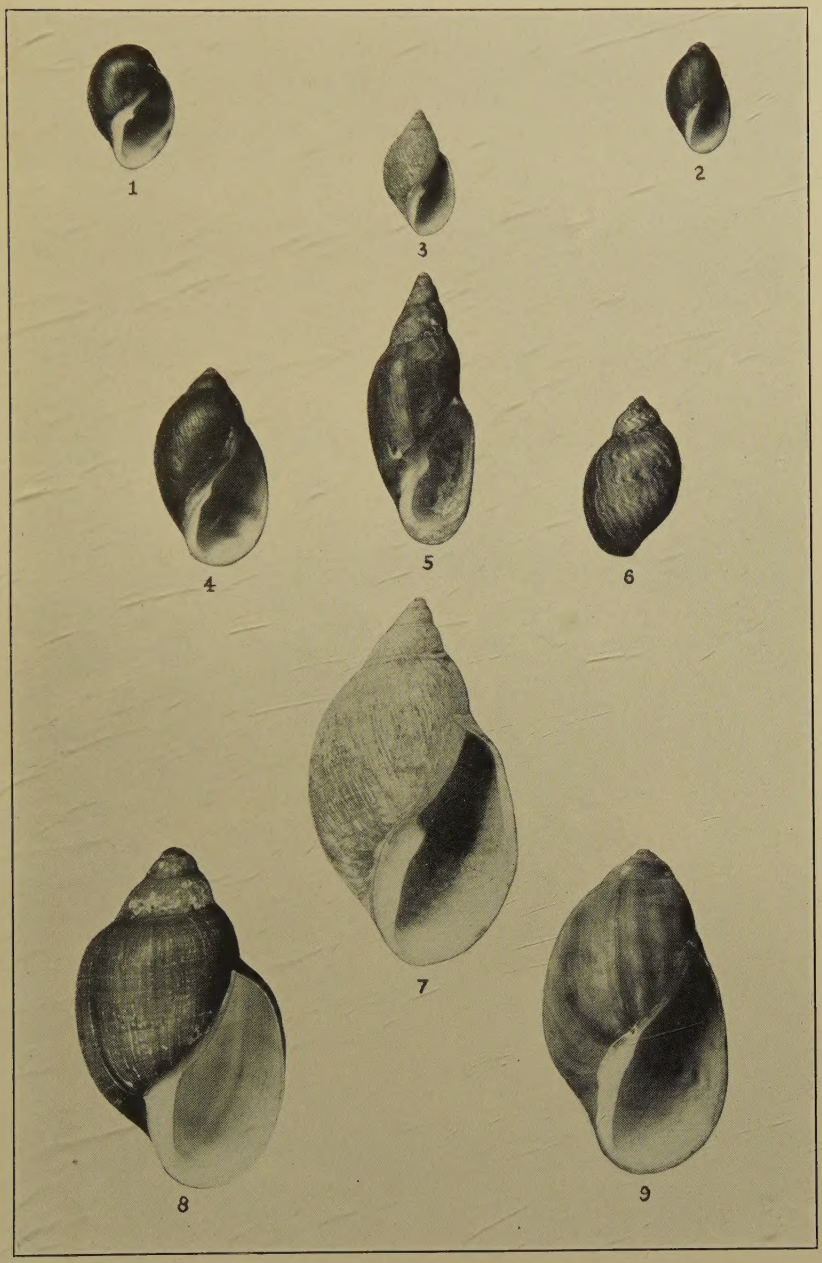

GASTROPODS OF THE GENUS CHILINA

1. *Chilina llanquihuensis*, new species; 2, *C. simplex*, new species (natural size); 3, *C. (Pseudochilina) lymnaeformis* Dall (type, natural size); 4, *C. bullocki*, new species; 5, *C. neuquenensis*, new species; 6, *C. bullocki*, paratype showing coloring revealed by removal of the periostracum; 7, *C. (P.) lymnaeformis* Dall (type, × 3); 8, *C. iheringi*, new species; 9, *C. simplex*, new species (× 3).